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APPEAL BRIEF

Appellant : Jun Lu et al.
App. No : 10/663,384
Filed : September 16, 2003
For : COMBINED STREAM
AUXILIARY COPY
SYSTEM AND METHOD
Examiner : Aurangzeb Hassan
Art Unit : 2182
Confirmation No. : 1609

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Christian A. Fox, Reg. No. 58,507

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Commissioner for Patents
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Alexandria, VA 22313-1450

Dear Sir:

In accordance with the Notice of Appeal filed August 18, 2008, Appellant submits this Appeal Brief.

Appellant appeals the rejection of Claims 1, 2, 5, 6 and 11–14, each of which has been twice rejected in an Office Action dated May 19, 2008, in the above-captioned patent application.

This Appeal Brief is being filed in accordance with the rules of 37 C.F.R. § 41.37 and includes a Claims Appendix, an Evidence Appendix and a Related Proceedings Appendix.

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I. REAL PARTY IN INTEREST

The real party in interest is the assignee of record, CommVault Systems, Inc.

II. RELATED APPEALS AND INTERFERENCES

Appellant knows of no other appeals or interferences that will directly affect, be directly affected by or have a bearing on the Board's decision in this Appeal.

III. STATUS OF CLAIMS

Claims 1, 2, 5, 6 and 11–14, as listed in the Claim Appendix, remain pending and are the subject of this Appeal.

Claims 3, 4, 7, 8, 16–18, 21 and 25 were previously canceled.

On May 19, 2008, the Examiner at least twice rejected each of Claims 1, 2, 5, 6, 9–15, 19, 20, 22–24 and 26.

In an Amendment Accompanying Appellant's Appeal Brief filed concurrently herewith, Appellant cancels Claims 9, 10, 15, 19, 20, 22–24 and 26.

IV. STATUS OF AMENDMENTS

As disclosed in Section III above and accompanying the present Appeal Brief, Appellant has filed an Amendment in accordance with 37 C.F.R. § 41.33(b)(1) in an effort to reduce the number of issues on appeal. In particular, the accompanying Amendment cancels Claims 9, 10, 15, 19, 20, 22–24 and 26.

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V. SUMMARY OF CLAIMED SUBJECT MATTER

The present application includes three independent claims. Each independent claim is paraphrased below with citations to corresponding portions of the specification and drawings as required by 37 C.F.R. § 41.37(c)(1)(v).

These citations are provided in order to illustrate specific examples and embodiments of the recited claim language and not to limit or interpret the claims. Furthermore, a citation to a specific paragraph in the following claim summaries should be treated as a citation to all lines of that paragraph.

Claims 1, 11 and 12 are independent claims; however, before discussing each of the claims individually, Appellant has provided a brief overview.

Brief Overview

The claims of the present application are directed to methods and a recording medium for improving copy and restore operations in a multi-tiered storage system. As one example, the claimed embodiments provide for improved system efficiency while performing auxiliary copy operations on backed-up data stored across multiple storage devices.

Storage systems can have various levels of storage media that include copies of data from one or more data sources. A primary copy or data set can be stored on a first tier of storage media and can include, for example, data that is frequently accessed for a specified duration of time after it is stored (e.g., one to two weeks). Auxiliary copying denotes the creation of one or more secondary copies from the primary copy of data, often involving a second tier of storage media. Such auxiliary copies can be performed on data that is accessed less often and/or that has aged to a particular point.

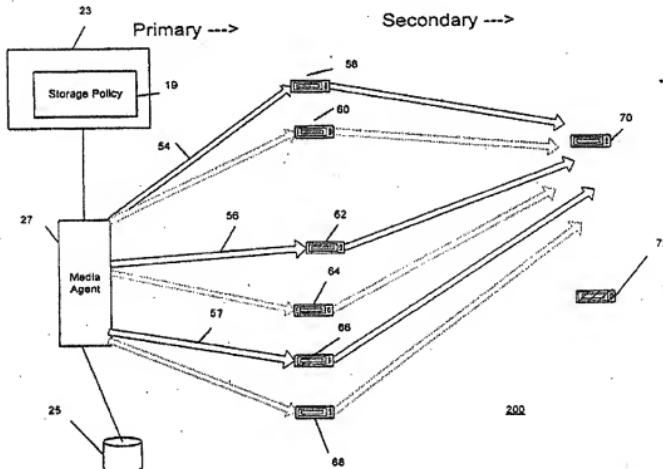
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To perform the copies, systems can use data streams, or channels, between two storage media. Unlike many conventional systems that assign a separate auxiliary data stream (i.e., between a first-tier storage medium and a second-tier storage medium) for each primary data stream (i.e., between a data source and a first-tier storage medium), the claimed embodiments of the invention provide for a combination of auxiliary data streams to be directed to a single storage medium, thereby allowing for data portions stored across multiple first-tier storage media to be stored in a combined data format on a second-tier storage medium. This can advantageously reduce the number of second-tier storage media required for an auxiliary copy operation and, consequently, can reduce the number of mount/unmount times needed to complete the copy.

Two-Tier Copy Operations

As discussed above, the claimed embodiments provide for two-tier copy operations. With reference to Figure 1 (depicted below) of Appellant's application, data on a data source (25) is initially divided into a first data portion and a second data portion (not shown). Primary copies of the two data portions are transferred from the data source (25) to a first tier of storage media (58, 62) via, respectively, multiple data streams (54, 56). That is, the first data portion is transferred from the data source (25) to storage medium (58) via data stream (54), and the second data portion is transferred to storage medium (62) via data stream (56).



The claims further include performing an auxiliary copy operation on the data portions stored on the different storage media (58, 62). In particular, during the auxiliary copy operation, data streams are combined to store the first and second data portions in a combined data format on storage medium (70) of the second tier of storage media. As a result, the number of second-tier storage media used to store the auxiliary data copy is advantageously less than the number of first-tier storage media used to store the primary data copy, which provides for several benefits such as assisting with media recycling.

Selective Data Stream Combination Based on Multiple File Types

The first and second data portions also include multiple data types. Before combining the data streams to perform the auxiliary copy operations on the data,

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multiple files types of the data portions are identified to determine if such data portions can be combined. For example, as described in Appellant's specification, certain file types are not conducive to a combined data stream operation. For instance, in one example of Appellant's invention, multi-stream structured query language (SQL) and IBM database (DB2) file types are not copied using combined data streams (see, e.g., page 12, lines 6-12). Rather, SQL data generally requires the same number of auxiliary data streams as the number of primary data streams (see, e.g., page 14, lines 19-20).

Thus, in addition to the multi-tier copy operations, claimed storage methods include detecting the multiple files types of the data within each data stream and determining if the data streams can be combined in an auxiliary storage operation. If the file types of the data in the first and second data portions can be combined, the claimed embodiments of the invention combine the data streams from the different first-tier storage media (58, 62) to be stored on the second-tier storage medium (70) in a combined data format.

In further embodiments, certain of the claims also include receiving input from a user as to whether or not data streams should be combined in an auxiliary copy operation. This input can be prompted, for example, through a pop-up window or other graphical user interface usable for obtaining instructions from the user. In such embodiments, the data streams are combined only when: (1) the multiple file types allow for the combination, and (2) the user requests combination of the data streams.

Restoring Data Portion from Combined Format to Data Source

Once the first and second portions of the data have been stored in a combined format on the storage medium (70) as an auxiliary (second) copy, the claimed

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embodiments further provide for the restoring of a portion of the data to the data source (25). In particular, the claims recite retrieving the first portion of the data from the combined data format of the auxiliary copy. Thus, the claimed embodiments do not require a restoration of an entire data set, but can retrieve only a portion of the data, such as data corresponding to a particular file type.

In certain examples, restoring a portion of the data can include the use of indexing and/or physical offsets to identify the first portion of the data within the combined format. Such can be especially helpful when the ordering of the first data portion within the combined format may differ from the ordering in which the primary copies of the first and second portions of the data were created on the first-tier storage media (58, 62). In other embodiments, the restoring of one or more files can proceed serially (e.g., chronologically based on the order in which the files were created), one at a time or in an arbitrary order.

Moreover, the combined format of the auxiliary copy can provide for a more efficient restore process than restoring from media of a primary copy since a fewer number of storage media can be used and reordering of the data can take place during the auxiliary copy process (see, e.g., page 14, lines 1-10).

Independent Claim 1

Claim 1 is directed to a method for transferring data in a multi-tiered storage system. With reference to Figure 2 of Appellant's application (depicted above), the method generally includes performing a primary, or first, backup operation to copy portions of data having multiple file types from a data source (25) to a first tier of storage devices (58, 60, 62, 64) using multiple data streams (54, 56). The method further includes performing an auxiliary, or second, backup operation to further copy

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the data portions in a combined data stream to a single storage device (70) of a second tier of storage devices if it is determined from the multiple file types that the data portions can be combined. The method finally includes performing a restore operation by retrieving a first portion of the data stored in the combined data format on the second-tier storage device (70).

In particular, the method of Claim 1 comprises:

- performing a first backup copy of data stored in a data source (25), wherein said performing of the first backup copy further comprises: (see, e.g., page 6, lines 11–13 and 20–23; page 9, lines 1–8)
- dividing the data in the data source (25) into at least a first portion of data and a second portion of data, the data comprising multiple file types, and (see, e.g., page 6, lines 11 and 20–21; page 9, lines 1–8)
- transferring the first and second portions of data from the data source (25) to a first storage medium (58, 60) and a second storage medium (62, 64) using a first data stream (54) and a second data stream (56) respectively to create the first backup copy of the data; (see, e.g., page 6, lines 12–13 and 21–23; page 9, lines 1–8)
- identifying the multiple file types of data in the first and second portions of data; (see, e.g., page 12, lines 6–12; Block S106 of Figure 3)
- determining based at least upon the file types if the first portion of data and the second portion of data in the first backup copy can be combined; (see, e.g., page 12, lines 6–12; Block S106 of Figure 3)
- if the first portion of data and the second portion of data can be combined, performing a second backup copy of the first and second portions of data,

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wherein the second backup copy saves the first and second portions of data in a combined format, wherein the performing of the second backup copy comprises: (see, e.g., page 12, lines 6–12; page 14, lines 18–20; Block S106 of Figure 3)

- transferring the first and second portions of the first backup copy of the data from the first and second storage mediums (58, 60, 62, 64) to a third storage medium (70) by combining data streams from the first and second storage mediums (58, 60, 62, 64), and (see, e.g., page 6, lines 13–15; page 6, line 23 through page 7, line 2; page 9, lines 8–9; page 15, lines 1–3)
- storing on the third storage medium (70), the additional copies of the data by storing in a combined format, the first and second portions of the first backup copy to create the second backup copy; and (see, e.g., page 13, lines 7–8; page 14, lines 1–2)
- restoring the first portion of data to the data source (25) by retrieving the first portion of data from the combined format of the second backup copy (see, e.g., page 13, line 15, through page 14, line 2; page 14, lines 8–9).

Independent Claim 11

Claim 11 is directed to a recording medium in a storage system with data stored thereon. The data on the recording medium is produced by:

- copying data from a data source (25) to a plurality of storage media (58, 50, 62, 64, 66, 68), wherein said copying comprises:
- splitting the data source data into at least a first and a second portion, (see, e.g., page 6, lines 11 and 20–21; page 9, lines 1–8)

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- transferring the first portion to a first storage medium (58, 60) using a first stream (56), (see, e.g., page 6, lines 12–13 and 21–23; page 9, lines 1–8)
- transferring the second portion to a second storage medium (62, 64) using a second stream (56); (see, e.g., page 6, lines 12–13 and 21–23; page 9, lines 1–8)
- identifying file types of data in the first and second portions of data; (see, e.g., page 12, lines 6–12; Block S106 of Figure 3)
- determining, based upon the file types, whether or not the first portion and the second portion are combinable into one or more data streams; and (see, e.g., page 12, lines 6–12; page 14, lines 18–20; Block S106 of Figure 3)
- transferring the first and second portion of data from the first and second storage medium (58, 60, 62, 64) to a third storage medium (70) using a third combined data stream to create additional copies of the first and second portions of data, wherein the additional copies store the first and second portions of data in a combined format; and (see, e.g., page 6, lines 13–15; page 6, line 23, through page 7, line 2; page 9, lines 8–9; page 13, lines 7–8; page 14, lines 1–2; page 15, lines 1–3)
- restoring the first portion of data by retrieving the first portion of data from the combined format of the additional copies stored in the third storage medium (70) (see, e.g., page 13, line 15, through page 14, line 2; page 14, lines 8–9).

Independent Claim 12

Claim 12 is directed to a method for transferring data in a storage system. The method comprises:

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- dividing a data source (25) into at least a first and a second portion of data; (see, e.g., page 6, lines 11 and 20–21; page 9, lines 1–8)
- transferring the first and second portion of data from the data source (25) to a first number of pieces of storage media (58, 60, 62, 64, 66, 68); (see, e.g., page 6, lines 11–13 and 20–23; page 9, lines 1–8)
- accessing user input regarding whether the first and second portions of data should be combined; (see, e.g., page 11, lines 11–18; page 13, lines 1–5; page 13, lines 9–11; page 14, lines 15–18; Block S102 of Figure 3)
- determining if the first portion of data and the second portion of data are combinable based upon files types contained in the first and second portions of data; and (see, e.g., page 12, lines 6–12; page 14, lines 18–20; Block S106 of Figure 3)
- transferring the first and second portion of data from the first number of pieces of storage media (58, 60, 62, 64, 66, 68) to a second number of pieces of storage media (70), the second number being less than the first number to create additional copies of the first and second portions of data, wherein the additional copies store the first and second portions of data in a combined format; and (see, e.g., page 6, lines 13–15; page 6, line 23, through page 7, line 2; page 8, 18–21; page 9, lines 8–13; page 13, lines 7–8; page 14, lines 1–2; page 15, lines 1–3)
- restoring the first portion of data by retrieving the first portion of data from the combined format of the additional copies stored in the second number of pieces of storage media (70) (see, e.g., page 13, line 15, through page 14, line 2; page 14, lines 8–9).

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VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following rejections are to be reviewed on appeal:

1. The rejection of Claims 1, 11 and 12 under 35 U.S.C. § 102(b), as being anticipated by Appellant's Admitted Prior Art ("AAPA"); and
2. The rejection of Claims 1, 2, 5, 6 and 11–14 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,154,852 to Amundson et al. ("the Amundson patent") in view of AAPA.

VII. ARGUMENT

A. Rejection of Claims 1, 11 and 12 under 35 U.S.C. § 102(b) as Being Anticipated by Appellant's Admitted Prior Art ("AAPA")

Claims 1, 11 and 12 are not properly rejected under 35 U.S.C. § 102(b) because AAPA does not disclose every limitation of each rejected claim.

1. Independent Claim 1

Independent Claim 1 is directed to a method for transferring data in a multi-tiered storage system. In general, the method can increase efficiency in a data storage management system by combining data streams during the performance of one or more auxiliary copy operations.

The method initially performs a first backup copy of data stored in a data source, wherein the data includes multiple file types. In performing the first backup copy, the data is divided into at least first and second portions and is transferred from the data source to a first storage medium and a second storage medium using, respectively, first and second data streams.

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The method includes identifying the multiple file types of data in the first and second data portions and determining, based at least on the file types, if the first and second portions of data can be combined. If they can be combined, the method performs a second backup copy of the first and second portions of data.

In performing the second backup copy, the method transfers the first and second data portions of the first backup copy from the first and second storage media to a third storage medium by combining data streams from the first and second storage media. The data from the combined data copy stream is then stored in a combined format on the third storage medium to create the second backup copy.

The method also includes restoring the first portion of the data to the data source by retrieving the first data portion from the combined format of the second backup copy stored on the third storage medium.

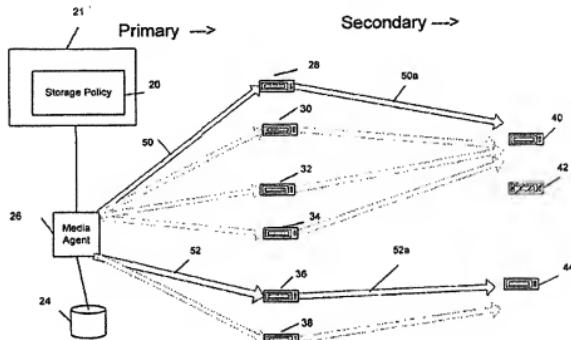
a. AAPA Does Not Disclose Determining if Multiple Portions of Backup Data Can Be Combined Based on File Types of the Data

The data transfer method of Claim 1 includes identifying multiple file types of data in the first and second data portions of a first backup copy and determining, based on the file types, if the first and second data portions can be combined by combining data streams to create a second backup copy.

AAPA relates to a storage management system that uses storage policies to direct how data is to be stored. In particular, the storage policies allow a user to define how, where and the duration for which data should be stored without requiring an intimate knowledge of the underlying storage architecture (see, e.g., page 2, lines 17-23).

As shown and described with reference to Figure 1 of Appellant's disclosure (depicted below), the AAPA system can divide data on a source (24) into two

portions, which are sent to separate storage media (28, 36) using, respectively, data streams (50, 52) (see, e.g., page 4, lines 7-8). Thus, a primary copy, or first backup copy, of the data can reside on the storage media (28, 36).



The AAPA system also allows for auxiliary coping, which is "performed on a stream-by-stream basis and one stream at a time" (page 4, line 22). In particular, and as shown above, an auxiliary copy of stream (50) (e.g., first data portion) is made using an auxiliary stream (50a) to storage medium (40), and, thereafter, an auxiliary copy of stream (52) (e.g., second data portion) is made using an auxiliary stream (52a) to storage medium (44) (see, e.g., page 5, lines 3-5).

On page 3 of the May 19, 2008 Office Action ("the Office Action"), the Examiner asserts that AAPA discloses "identifying multiple types of data in the first and second portions" and "determining based at least upon the file types if the first portion of data and the second portion of data can be combined." As a basis for this assertion, the Examiner cites generally the following paragraph of Appellant's disclosure:

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Storage policies generally include a copy name, a data stream, and a media group. A primary copy name may be established by default whenever a storage policy for a particular client is created and contains the data directed to the storage policy. A data stream is a channel between the source of the data, such as data streams 50 and 52 in FIG. 1 and the storage media such as data streams 50 and 52 in FIG. 1. Such a data stream is discussed in HIGH-SPEED DATA TRANSFER MECHANISM, Ser. No. 09/038,440 referenced above. To increase the speed of a copy, data to be backed-up is frequently divided into a plurality of smaller pieces of data and these pieces are sent to a plurality of storage media using their own respective data streams. In FIG. 1, data from source 24 is broken into two portions and sent using streams 50, 52 to media 28, 36.

This paragraph does not address any determination as to whether or not two data portions of a first backup copy, which were created with different data streams and which reside on different storage media, can be combined by combining multiple data streams to create an auxiliary backup copy. Rather, the above paragraph relied upon by the Examiner is concerned with the creation of two data streams (50, 52) to copy data from the data source (24) to separate media (28, 36). Thus, this disclosure is directed to a process that is opposite the recited limitation of Claim 1.

b. AAPA Does Not Disclose Combining Data Streams to Transfer Multiple Portions of Data from Different Media to Store Data in a Combined Format on Another Storage Medium

Claim 1 further recites transferring the first and second portions of a first backup copy of data from first and second storage media to a third storage medium by combining data streams from the first and second storage media and storing on the third storage medium the first and second portions in a combined format.

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As discussed above, in the AAPA system described in Appellant's disclosure, each stream used to create a primary copy of data has a corresponding, separate auxiliary stream to create an auxiliary copy of that data (see, e.g., page 5, lines 3–5). That is, the primary copy of the first data portion corresponding to the first data stream (50) has a corresponding auxiliary copy on storage medium (40) created through auxiliary data stream (50a). Likewise, the primary copy of the second data portion corresponding to the second data stream (52) has a corresponding auxiliary copy on a separate storage medium (44) created through a separate auxiliary data stream (52a).

There is no combining of data from different data streams in the discussed AAPA. Moreover, as explained in Appellant's disclosure, a drawback of the AAPA system is that "the stream-by-stream basis used in auxiliary copying does not minimize the number of mount/unmount times necessary for the auxiliary copy and does not minimize tape usage" (page 5, lines 18–20).

c. AAPA Does Not Disclose Restoring a First Portion of Data to a Data Source by Retrieving the First Portion from a Second Backup Copy Having a Combined Format

Independent Claim 1 further recites "restoring the first portion of data to the data source by retrieving the first portion of data from the combined format of the second backup copy."

AAPA of Appellant's disclosure does not disclose retrieving a portion of data from a combined format of an auxiliary backup copy. On page 3 of the Office Action, the Examiner generally refers to page 5, line 14, through page 6, line 2, as the basis for the prior art disclosure of this limitation. However, this paragraph, as shown below in relevant part, makes no mention of such a restore process:

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[T]he process for restoring copied data may require access to several media, which involves multiple mounting/unmounting of media, thereby increasing the time necessary for a restoration. Additionally, although an effort is made to minimize the number of times media are mounted and unmounted, the stream-by-stream basis used in auxiliary copying does not minimize the number of mount/unmount times necessary for the auxiliary copy and does not minimize tape usage. For example, in FIG. 1, media 40 and 44 may both be less than half full but both are needed to copy data through streams 50a, 52a using conventional techniques and both must be remounted for a restore.

As can be seen, AAPA does not disclose “restoring the first portion of data to the data source by retrieving the first portion of data from the combined format of the second backup copy,” as recited in independent Claim 1 (emphasis added).

d. Summary

Because AAPA does not disclose every element of independent Claim 1, Appellant maintains that the rejection of Claim 1 under 35 U.S.C. § 102(b) is improper.

2. Independent Claim 11

The rejection of independent Claim 11 is improper for the reasons set forth above with respect to the patentability of Claim 1 and because of the additional limitations recited therein. However, for the purposes of this Appeal of the rejection under 35 U.S.C. § 102(b), Claim 11 stands or falls with Claim 1.

3. Independent Claim 12

The rejection of independent Claim 12 is improper for the reasons set forth above with respect to the patentability of Claim 1. Moreover, as discussed in more detail below, AAPA does not disclose additional elements recited in independent Claim 12.

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a. AAPA Does Not Disclose Accessing User Input Regarding Whether the First and Second Portions of Data Should be Combined

Independent Claim 12 further recites “accessing user input regarding whether the first and second portions of data should be combined.”

AAPA does not disclose accessing user input that indicates whether or not first and second portions of data stored on a first number of storage media should be combined in a second copy operation. In particular, in the Office Action, the Examiner makes no reference to this limitation of Claim 12 in its rejection under 35 U.S.C. § 102(b). Thus, the Examiner has failed to make a prima facie case of anticipation (see, e.g., M.P.E.P. § 2131 (stating that in order to anticipate a claim, a prior art reference must identically teach every element of the claim)). Rather, the Examiner improperly groups each of the independent claims together without considering their differing limitations.

Moreover, as discussed above with respect to Claim 1, the AAPA system does not combine data from different data streams. Thus, there would be no reason or suggestion for a user to input data indicating whether or not different portions of data from different data streams should be combined in a second copy operation.

b. Summary

Because AAPA does not disclose each and every element of independent Claim 12, Appellant maintains that the rejection of Claim 12 under 35 U.S.C. § 102(b) is improper.

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B. Rejection of Claims 1, 2, 5, 6 and 11–14 under 35 U.S.C. § 103(a) as being Unpatentable over the Amundson Patent in view of AAPA

Claims 1, 2, 5, 6 and 11–14 are not properly rejected under 35 U.S.C. § 103(a) because the Amundson patent and AAPA do not teach or suggest every limitation of each rejected claim. Furthermore, Appellant respectfully submits that the Amundson patent and AAPA are not properly combinable.

As an initial matter, although the Examiner indicates on page 4 of the Office Action that the rejection under 35 U.S.C. § 103(a) is based on a combination of the Amundson patent and AAPA, the Examiner makes no reference to AAPA in support of the rejection of the claims, nor does the Examiner put forth any explanation as to how or why the two references can be combined. Rather, the reasoning for the obviousness rejections appears to be based solely on the Amundson patent. Thus, the following discussion of the rejection will focus primarily on the differences between the pending claims and the teachings of the Amundson patent.

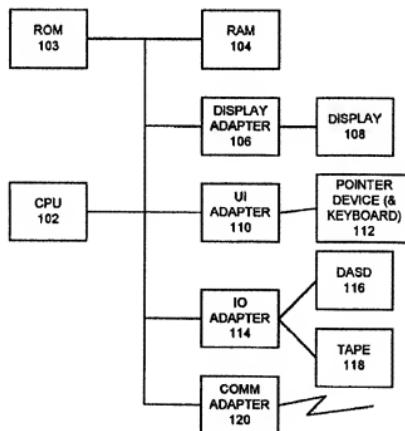
However, by this discussion, Appellant is not conceding that the Amundson patent is properly combinable with AAPA. Rather, because the Examiner has not offered any reason or explanation on how the Amundson patent and AAPA are combined to teach the claimed invention, Appellant is unable to present arguments against such a combination. Appellant further submits that even if the Amundson patent and AAPA are combined, even though such a combination may be improper, the combination of the references still fails to teach or suggest each limitation of the rejected claims.

1. Independent Claim 1

Neither the Amundson patent, nor AAPA, nor a combination thereof, teaches or suggests the method of independent Claim 1 for transferring data in a multi-tiered storage system.

With particular reference to Figure 1 of the Amundson patent (depicted below), the disclosure is directed to a system and method for backing up data (136) across multiple tape drives (118) to perform load balancing (see, e.g., column 3, lines 35–38 and 50–61). When the backed-up data is to be restored, a number of the tapes drives (118) are selected to perform a recovery process to a direct access storage device (DASD) (116) (see, e.g., column 12, lines 13–34). In particular, the Amundson system restores multiple pieces of a single data object based on a unique identifier associated with the pieces (see, e.g., column 5, lines 25–32; column 6, lines 1–6).

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a. None of the Cited References Teaches or Suggests Determining if Multiple Portions of Backup Data Portions Can Be Combined Based on File Types of the Data Portions

The data transfer method of Claim 1 includes identifying multiple file types of data in the first and second portions of a first backup copy and determining, based on the file types, if the first and second portions can be combined through a combined data stream to another storage device to create a second backup copy.

The Amundson patent does not appear to teach or suggest, among other things, dividing and transferring data having multiple file types to multiple storage media and determining if the data portions can be combined based upon the multiple file types of the data in the first and second portions. Rather, the Amundson patent appears to disclose using load balancing to back up a large data object over a plurality of drives (see, e.g., column 3, lines 50–61). Moreover, the Amundson patent suggests that the large data object is of a single type (see, e.g., column 4, lines 52–55).

The Examiner acknowledges on page 6 of the Office Action that the Amundson patent does not teach “identifying the multiple file types” in various types of data in data streams. Yet, the Examiner continues to assert without additional documentary evidence that such a modification to the Amundson system would have been obvious to one or ordinary skill in the art at the time of Appellant’s invention. Such broad conclusory statements are improper in an obviousness rejection (see, e.g., KSR Int’l v. Teleflex Inc., 550 U.S. ___, 82 U.S.P.Q.2d 1385, 1396 (2007) (citing In re Kahn, “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)).

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Moreover, Appellant disagrees with the Examiner's assertion. The Amundson patent is concerned with the improved storage and restoration of a large data object over multiple pieces of storage media, not data from multiple data streams having multiple file types. As the Examiner acknowledges, the Amundson patent does not contemplate identifying file types of data to be stored. Thus, it would be illogical for the Amundson system to further determine based on identified file types if first and second portions of data from different data streams can be combined in a third, combined data stream to be stored on another storage device.

b. None of the Cited References Teaches or Suggests Creating a Second Backup Copy from Portions of a First Backup Copy and Restoring a First Portion by Retrieving the First Portion from the Combined Format of the Second Backup Copy

The data transfer method of Claim 1 includes: (1) making a first backup copy of first and second portions of source data, (2) then making a second backup copy, wherein the second backup copy stores the first and second portions of the first backup copy in a combined format, and (3) restoring the first portion of data by retrieving the first portion of data from the combined format of the second backup copy.

The Amundson patent does not teach or suggest the multi-level storage method of Claim 1. Rather, the Amundson patent teaches the use of a single-level storage system in which an object is stored over multiple drives in a manner to improve restoring of the object. In particular, the Amundson system appears to store a single backup copy of data on tape drives (118). Moreover, on page 9 of the Office Action, the Examiner describes the Amundson system as being a single-level backup system. In particular, the Examiner states that:

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Amundson teaches a system where a primary set of streams are used in a backup process and upon completion a recovery process combines data from the backup tapes into the recovery tapes.

Thus, the Amundson system appears to make a primary copy of an object across multiple backup tapes from which the object can be directly recovered to one or more recovery tapes.

Even if the Amundson system were to perform a second backup copy of the data object, the Amundson patent does not teach or suggest that first and second portions of the first backup copy are copied in a combined format to create the second backup copy. As recited in Claim 1, the second backup copy stores the first and second portions of data from the first backup copy in a combined format on another storage medium. The Amundson patent, on the other hand, is concerned with the separation of a data object during storage and contemplates a combining process only when the data object is to be recovered.

Furthermore, Amundson appears to make no reference to restoring a retrieved data portion from a combined data format to the data source from which the data was initially copied during the primary copy operation. Rather, Amundson discloses that when the entire data object stored on the tape drives (118) is to be restored, the entire data object is copied to the DASD (116) (see, e.g., column 12, lines 13–34).

c. Summary

Because the cited references are not properly combinable and, even if combined, do not teach or suggest each limitation of independent Claim 1, Appellant respectfully maintains that the rejection of Claim 1 under 35 U.S.C. § 103(a) is improper.

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2. Claims 2, 5, 6, 11, 13 and 14

The rejection of each of independent Claim 11 and dependent Claims 2, 5, 6, 13 and 14 is improper for the reasons set forth above with respect to the patentability of Claim 1 and because of the additional limitations recited therein. However, for purposes of this Appeal, Claims 2, 5, 6, 11, 13 and 14 stand or fall with Claim 1.

3. Independent Claim 12

The rejection of independent Claim 12 is improper for the reasons set forth above with respect to the patentability of Claim 1. Moreover, as discussed in more detail below, the combination of the Amundson patent and AAPA does not disclose additional elements recited in independent Claim 12.

a. None of the Cited References Teaches or Suggests Accessing User Input Regarding Whether the First and Second Portions of Data Should be Combined

Independent Claim 12 further recites “accessing user input regarding whether the first and second portions of data should be combined.”

The Amundson patent does not teach or suggest accessing user input to determine whether first and second portions of data of a first copy should be combined from different storage media in another data stream to create a second copy of the data.

On page 8 of the Office Action, the Examiner cites column 12, lines 14–17, of the Amundson patent for teaching that the “user specifies when to begin recovery of data, combining the first and second portion of data.” This portion of the Amundson patent reads:

When the user wants to recover one or more objects from the backup tape media onto the DASD 116 recovery commands are used that are provided as part of operating system 130 to recover the data. These

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recovery commands allow the user to specify an existing media definition 140 that will control the recovery. The media definition 140 contains the same information that was used to control the backup process.

This portion of the Amundson patent relied upon by the Examiner relates to the recovery of data and not to a second (auxiliary) copy operation on a first copy of data from a first set of storage media to another piece of storage media, wherein the second copy of data is available for recovery. Nor does the Amundson patent indicate that a user can specify whether or not data should be combined in performing a copy operation. A teaching of combining data in a recovery operation to achieve a form in which the data previously existed is entirely different than the selective combination of data in an auxiliary copy operation.

b. Summary

Because the cited references are not properly combinable and, even if combined, do not teach or suggest each limitation of independent Claim 12, Appellant respectfully maintains that the rejection of Claim 12 under 35 U.S.C. § 103(a) is improper.

C. Conclusion

In view of the foregoing arguments distinguishing Claims 1, 2, 5, 6 and 11–14 over the art of record, Appellant respectfully requests that the rejections of these claims be reversed.

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Please charge any additional fees, including any fees for additional extensions of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

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VIII. CLAIMS APPENDIX

1. A method for transferring data in a multi-tiered storage system, the method comprising:

performing a first backup copy of data stored in a data source, wherein said performing of the first backup copy further comprises:

dividing the data in the data source into at least a first portion of data and a second portion of data, the data comprising multiple file types, and

transferring the first and second portions of data from the data source to a first storage medium and a second storage medium using a first data stream and a second data stream respectively to create the first backup copy of the data;

identifying the multiple file types of data in the first and second portions of data;

determining based at least upon the file types if the first portion of data and the second portion of data in the first backup copy can be combined;

if the first portion of data and the second portion of data can be combined, performing a second backup copy of the first and second portions

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of data, wherein the second backup copy saves the first and second portions of data in a combined format, wherein the performing of the second backup copy comprises:

transferring the first and second portions of the first backup copy of the data from the first and second storage mediums to a third storage medium by combining data streams from the first and second storage mediums, and

storing on the third storage medium, the additional copies of the data by storing in a combined format, the first and second portions of the first backup copy to create the second backup copy; and

restoring the first portion of data to the data source by retrieving the first portion of data from the combined format of the second backup copy.

2. The method as recited in claim 1, wherein the transfer from the first and second storage medium to the third storage medium is performed in chunks.

3. (Canceled)

4. (Canceled)

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5. The method as recited in claim 1, wherein the transfer using the third data stream is performed based on a client identification of the first and second portion of data.

6. The method as recited in claim 1, wherein the transfer using the third data stream is performed based on respective stream numbers of the first and second streams.

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. A recording medium in a storage system with data stored thereon, the data produced by:

copying data from a data source to a plurality of storage media, wherein said copying comprises

splitting the data source data into at least a first and a second portion,

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transferring the first portion to a first storage medium using a first stream,

transferring the second portion to a second storage medium using a second stream;

identifying file types of data in the first and second portions of data;

determining, based upon the file types, whether or not the first portion and the second portion are combinable into one or more data streams; and

transferring the first and second portion of data from the first and second storage medium to a third storage medium using a third combined data stream to create additional copies of the first and second portions of data wherein the additional copies store the first and second portions of data in a combined format; and

restoring the first portion of data by retrieving the first portion of data from the combined format of the additional copies stored in the third storage medium.

12. A method for transferring data in a storage system, the method comprising:

dividing a data source into at least a first and a second portion of data;

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transferring the first and second portion of data from the data source to a first number of pieces of storage media;

accessing user input regarding whether the first and second portions of data should be combined;

determining if the first portion of data and the second portion of data are combinable based upon files types contained in the first and second portions of data; and

transferring the first and second portion of data from the first number of pieces of storage media to a second number of pieces of storage media, the second number being less than the first number to create additional copies of the first and second portions of data wherein the additional copies store the first and second portions of data in a combined format; and

restoring the first portion of data by retrieving the first portion of data from the combined format of the additional copies stored in the second number of pieces of storage media.

13. The method of Claim 1, additionally comprising providing a user notification if the first portion of data and the second portion of data cannot be combined.

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14. The method of Claim 1, wherein the first portion of data is associated with a first application and the second portion of data is associated with a second application.

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Canceled)

26. (Canceled)

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IX. EVIDENCE APPENDIX

None.

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X. RELATED PROCEEDINGS APPENDIX

None.

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